IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

	Jerzy Kuczynski	Docket No.	2156-340A
Serial No.:	10/500,635	Examiner:	Joshua Zimmerman
Filing Date:	March 30, 2005	Art Unit:	2854
Title:	Method for Production of a Flexographic Printing Plate and Flexographic Printing Plate Obtained According to Said Method		

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REPLY BRIEF UNDER 37 C.F.R. SECTION 41.41

Appellants submit herein a Reply Brief for the above captioned application pursuant to 37 C.F.R. Section 41.41.

No charges are believed due, however, if needed please charge Deposit Account No. 50-0447 for the filing of the Reply Brief.

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1. **Status of Claims:**

Claims 1-17: Pending

Claim 18: Canceled

Claims 19-29: Pending

Thus, claims 1-17 and 19-29 are currently pending and are subject of the instant appeal.

All of the pending claims 1-17 and 19-29 have been at least twice rejected.

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2. **Grounds of Rejection To Be Reviewed on Appeal**

Whether claims 1, 2, 5, 13, 15-17, 19, 22-25, 28 and 29 are unpatentable under 35 U.S.C. §103(a) over alleged Applicants' Admitted Prior Art (hereinafter "AAPA") in view of U.S. Patent No. 6,541,183 to Teng (hereinafter "Teng").

Whether claims 3, 4 and 27 are unpatentable under 35 U.S.C. §103(a) over alleged AAPA in view of Teng and U.S. Patent No. 3,264,103 to Cohen (hereinafter "Cohen").

Whether claims 6-12 and 26 are unpatentable under 35 U.S.C. §103(a) over alleged AAPA in view of Teng and FR 2803245 or U.S. Patent Publication No. 2003/0054153 to Kuczynski (hereinafter "Kuczynski").

Whether claim 19 is unpatentable under 35 U.S.C. §103(a) over alleged AAPA in view of Teng and U.S. Patent No. 5,795,647 to Robinson (hereinafter "Robinson").

Whether claims 20, 21 and 26 are unpatentable under 35 U.S.C. §103(a) over alleged Applicants' Admitted Prior Art (hereinafter "AAPA") in view of Teng and U.S. Patent No. 5,706,731 to Francille (hereinafter "Francille").

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3. Argument

This Reply Brief is being filed in response to the arguments set forth in the Examiner's Answer. Additional arguments are set forth in the Appeal Brief previously filed on October 2, 2009.

Firstly, Appellants note that the present invention relates to a method for the production of a flexographic printing plate, which by definition is a relief image printing plate. As discussed in Cohen (which is relied on by the Examiner in his rejection of the claims), "[p]rinting plates with uniform printing height can be produced directly by exposing to actinic light, through an image-bearing process transparency, a photopolymerizable layer coated on a support, until substantially complete polymerization of the composition occurs in the exposed areas with substantially no polymerization in the non-exposed areas. Portions of the layer in the latter areas are generally removed by treatment with a suitable solvent in which the polymerized composition in the exposed areas is insoluble leaving a relief image of the text of the transparency suitable for direct use as a printing plate, especially for letter press work or dry off-set" (col. 1, lines 18-30). Thus, it can be seen that a process for producing a flexographic printing plate involves imaging the printing plate to polymerize certain areas of the plate and then removing the unpolymerized areas to reveal the relief image therein. Flexographic relief image printing elements typically comprise the following layers:

Photopolymerizable layer
Substrate

In addition, as described in Cohen, the printing plates are most applicable to those classes of printing where a distinct difference in height between printing and non-printing areas is required. These classes include those wherein the ink is carried by the raised portion of the relief such as in flexographic printing and ordinary letterpress printing (col. 8, lines 47-55).

On the other hand, lithographic printing plates (as described by Teng) (after process) generally consist of ink-receptive areas (image areas) and ink-repelling areas (non-image areas). During printing operation, an ink is preferentially received in the image areas, not in the non-image areas, and then transferred to the surface of a material upon which the image is to be produced. Commonly the ink is transferred to an intermediate material called printing blanket, which in turn transfers the ink to the surface of the material upon which the image is to be produced.

Lithographic printing can be further divided into two general types: wet lithographic printing (conventional lithographic printing) and waterless lithographic printing. In wet lithographic printing plates, the ink-receptive areas consist of oleophilic materials and the ink-repelling areas consist of hydrophilic materials; fountain solution (consisting of primarily water) is required to continuously dampen the hydrophilic materials during printing operation to make the non-image areas oleophobic (ink-repelling). In waterless lithographic printing plates, the ink-receptive areas consist of oleophilic materials and the ink-repelling areas consist of oleophobic materials; no dampening with fountain solution is required (col. 1, lines 23-36).

Lithographic printing plates (processed) are generally prepared from lithographic printing plate precursors (also commonly called lithographic printing plates) comprising a substrate and a photosensitive coating deposited on the substrate, the substrate and the photosensitive coating having opposite surface properties (such as hydrophilic vs. oleophilic, and oleophobic vs. oleophilic). The exposed plate is usually developed with a liquid developer to bare the substrate in the non-hardened or solubilized areas (col. 1, lines 37-55).

Thus, lithographic printing plates typically comprise the following layers:

Radiation sensitive coating layer
Substrate with a hydrophilic or oleophilic surface

Or

Radiation sensitive coating layer
Substrate with a oleophilic or olcophobic surface

In the lithographic printing plates described by Teng, the two layers each exhibit an affinity or aversion to at least one printing liquid that is substantially opposite to the affinity or aversion of the other layer and printing is accomplished by ink being received in the image areas (i.e., ink receptive layers) and then transferred to the surface to be produced.

Thus, it can be seen that the process of formulating relief image printing plates (such as flexographic plates) is very different from the process of formulating lithographic printing plates and relies on a different mechanism (i.e., relief image versus affinity/aversion to printing liquid) for printing and also uses different materials to achieve a different result.

a. **Rejection of claims 1, 2, 5, 13, 15-17, 19, 22-25, 28 and 29 over alleged AAPA in view of Teng.**

The Examiner relies on "Applicants' Admitted Prior Art" (AAPA) as his main source for rejecting the claimed invention.

The Examiner acknowledges that the alleged AAPA fails to teach that the laser light has a wavelength of 390 to 410 nm, that the solid layer includes at least one photoinitiator sensitive to the laser light at the wavelength and that the photoinitiator undergoes a photoreaction under effect of the laser light to bleach the layer of light sensitive material wherein the bleaching renders the crosslinked zones transparent to the

laser light in order to enable cross-linking throughout the thickness of the layer of light sensitive material and uses Teng to cure the deficiencies of the alleged AAPA.

In particular, the Examiner asserts that Teng describes that violet laser diodes having a wavelength of "about 405 nm" are preferred because they have lower cost and that Teng further teaches the use of a bundle of diodes to have higher throughput and concludes that it would be obvious to use a bundle of violet laser diodes in order to have a lower cost method with higher throughput.

Appellant respectfully disagrees.

Firstly, Teng is not properly combinable with alleged AAPA because the alleged AAPA and Teng describe different types of printing plates (flexographic versus lithographic) that use different mechanisms and different materials and thus achieve very different results. Appellants respectfully submit that a person skilled in the art of flexographic printing plates would not look to a reference concerning lithographic printing plates because the problems being solved would be very different.

A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention (see M.P.E.P. §2141.02). In this instance, Teng discusses the use of a bundle of laser diodes but with the acknowledgement that such a multiple laser design is very expensive and complex and that there is a challenge to achieve sufficient photospeed for violet and other visible laser imageable plates. Appellants further note that Teng discusses visible light lasers including violet laser diodes (col. 10, lines 43-47). Teng goes on to state that ***as for infrared diode***, violet laser diode is especially useful for on-press imaging and because of its small size and relatively lower cost (col. 10, lines 47-51). Appellants respectfully submit that violet laser diodes are not infrared diodes as the wavelength is very different. Thus, it cannot be said that a violet laser diode is the laser that is useful because of its size and cost, as asserted by the Examiner because it is not an infrared laser. In addition, the

exposure dosage listed in Teng appears refers to the exposure dose for an infrared laser and there is no teaching or suggestion that such an exposure dosage would be suitable for a violet laser diode.

In addition, the Examiner also looks to Teng for a suggestion to use a violet diode laser (about 410 nm) to expose a photopolymer. However, Teng is directed to the fabrication of a lithographic printing plate which uses a flat surface (without relief) to print using variations in hydrophobicity and hydrophilicity across the surface of the plate. The lasers used by Teng are used to create this variation of affinity for water or oil across the surface of the plate, not to create a relief using difference in thermal viscosity. Thus a person skilled in the art of producing relief image printing plates would not look to Teng for the artisan reading Teng would not be held to use the laser recommended by Teng in the process of the claimed invention because they are used to create different effects as discussed above.

For all of these reasons, and for the additional reasons provided in the Appeal Brief filed on October 2, 2009, it is believed that the present invention can be distinguished from the alleged AAPA as modified by Teng and the rejection of claims 1, 2, 5, 13, 15-17, 19, 22-25, 28 and 29 as being unpatentable over AAPA in view of Teng should be withdrawn.

b. **Rejection of Claims 3, 4 and 27 under 35 U.S.C. § 103(a) over alleged AAPA in view of Teng and Cohen.**

The Examiner asserts that AAPA as modified by Teng fails to teach that the non-crosslinked zones are removed by liquefying the zones which are not crosslinked thermally, without using solvents and used Cohen to cure the deficiencies of AAPA as modified by Teng. The Examiner concludes that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the dry process of Cohen in the method of AAPA as modified by Teng in order to avoid using toxic chemicals.

Appellant respectfully disagrees.

As discussed above, Teng describes a method of making a lithographic printing plate having a semi-solid radiation sensitive layer. As also discussed above, Teng is not combinable with the alleged AAPA because of the differences in printing plate construction between flexographic printing plates and lithographic printing plates, including difference in materials and differences in development. As further discussed in Teng, lithographic printing plates (after process) generally consist of ink receptive areas (image areas) and ink-repelling areas (non-image areas). During printing operation, an ink is preferentially received in the image areas, not in the non-image areas, and then transferred to the surface of a material upon which the image is to be produced. Commonly, the ink is transferred to an intermediate material called a printing blanket, which in turn transfers the ink to the surface of the material upon which the image is to be produced (col. 1, lines 14-23). Teng further discusses that the exposed plate is developed with a liquid developer to bare the substrate in the non-hardened or solubilized areas (col. 1, lines 53-55). Alternatively, on-press developable lithographic printing plates are described in which the plates are directly mounted on the press after exposure and developed with ink and/or fountain solution during the initial press operation (col. 1, lines 56-60).

Therefore, it is respectfully submitted that the alleged AAPA as modified by Teng would not be capable of being developed using the dry process of Cohen because the lithographic printing plates described in Teng are not capable of being developed in a dry process but must be liquid or solvent developed. Thus, contrary to the Examiner's assertions it would be not be obvious to one skilled in the art to have modified the AAPA modified by Teng to use thermal development as disclosed in Cohen because the lithographic printing plates of the Teng would be not be capable of being developed thermally and thus it would not be obvious to substitute the dry process of Cohen into the process of the alleged AAPA in view of Teng.

In addition, claim 4, which depends from claim 3 is also believed to be allowable over the prior art of record.

Furthermore claim 27 is also believed to be allowable over the prior art of record for the reasons provided herein with regards to claim 3.

For all of these reasons it is believed that the present invention can be distinguished from the alleged AAPA as modified by Teng alone or in combination with Cohen and the rejection of claims 3, 4, and 27 as being unpatentable over AAPA in view of Teng and Cohen should be withdrawn.

c. **Rejection of Claims 6-12 and 26 under 35 U.S.C. § 103(a) over alleged AAPA in view of Teng and Kuczynski.**

As to claims 6-8, Appellants respectfully submit that the teachings of Kuczynski referenced by the Examiner relate to complementary crosslinking systems for the compressible layer and **not** to complementary crosslinking systems for the photopolymer layer on top of the compressible layer in which the image is created. Kuczynski does not describe or suggest that the photopolymer layer in which the image is created has complementary crosslinking systems, but only that the compressible layer has complementary crosslinking systems. This is evidenced by at least ¶¶[0190]-[0192] in which Kuczynski discloses that the printing plate can be hardened at a later time to harden the compressible layer.

Thus, Kuczynski uses the complementary crosslinking systems to change the properties of the compressible layer but not describe or suggest that it is desirable to change the properties of the photopolymer layer in which the image is created as described and claimed in the present invention and there is no teaching or suggestion in Kuczynski or in Teng that the imageable layer itself has at least two complementary systems as asserted by the Examiner.

Appellants further submit that it is improper to compare the lithographic layer of Teng with the compressible layer of Kuczynski. The objective of Kuczynski is to provide a flexographic printing plate whose compressibility is not uniform over the entire printing plate (¶[0018]). Thus, the compressible layer includes monomers that are not activated by the means which cause cross-linking of the copolymer material of the compressible layer (¶¶[0062]-[0064]). The monomers and the photopolymer layer in Kuczynski are activated by UV light simultaneously (¶[0070]).

In Kuczynski, at first, only the compressible layer is crosslinked by heat, isocyanates, electron bombardments or X rays (e.g., ¶[0095] and ¶[0190]). In a subsequent step, the printing plate is irradiated by different means, i.e., UV radiation, in order to initiate cross-linking of the compressible layer (¶[0192]). The UV radiation step can take place during the development of the photopolymer layer of the printing plate (¶[0194]). There is no teaching or suggestion in Kuczynski of using laser light, as claimed. In addition, the compressible layer has a thickness between 0.76 and 6.22 mm, preferably between 1.0 and 2.8 mm (¶¶ [0225]-[0226]).

In contrast, Teng teaches treating a lithographic layer by irradiation with visible or ultraviolet laser light (col. 1, lines 8-11; col. 5, lines 38-67; col. 10, lines 43-50). The printing plate of Teng is an offset printing plate with a semi-solid layer of about one micron (col. 5, line 14). The semi-solid layer of Teng is very different from the compressible layer of Kuczynski (and the photopolymer layer of this invention) and is not comparable therewith. While Teng teaches using initiators, Teng does not teach the use of bleaching photoinitiators. Bleaching photoinitiators would be completely unnecessary in Teng because of the thinness of the layer to be crosslinked.

The UV light of Kuczynski would not be replaceable with the laser light of Teng, as suggested in the Office Action, because the UV light for the subsequent cross-linking step of the photopolymer layer of the printing plate of Kuczynski must simultaneously

activate the monomers which are distributed in the compressible layer. Accordingly, replacing the UV light of Kuczynski with the laser light of Teng would fundamentally alter the principle of operation of the method of Kuczynski, in contravention of MPEP § 2143.01. Therefore, the obviousness rejection cannot be maintained.

Furthermore, the claimed method also provides a photo-crosslinked polymer with a strong elastomeric character. As Dr. Decker attests, such a strong elastomeric character can only be achieved using high molecular weight rubbers bearing reactive double bonds as a starting material (Decker Declaration, ¶7). Teng, in contrast, cannot provide a photo-crosslinked polymer with a strong elastomeric character because Teng does not use high molecular weight rubbers bearing reactive double bonds as a starting material, as Dr. Decker explains (Decker Declaration, ¶ 7). Accordingly, Teng cannot render the present claims obvious.

In addition, because claims 1-2, 5-13, 15-16 and 19-29 are believed to be allowable over the prior art of record for the reasons provided above, claims 9-12 and 26, which depend therefrom, are also believed to be allowable over the prior art of record and notice to that effect is earnestly solicited.

For all of these reasons it is believed that the present invention can be distinguished from the alleged AAPA as modified by Teng alone or in combination with Kuczynski and the rejection of claims 6-12 and 26 as being unpatentable over AAPA in view of Teng and Kuczynski should be withdrawn.

d. <u>Rejection of Claim 14 under 35 U.S.C. § 103(a) over alleged AAPA in view of Teng and Robinson.</u>

Firstly the comments regarding the allegedly admitted prior art and Teng, as made above, are incorporated here.

In addition Robinson does not properly suggest the claim element. Robinson merely discloses the possibility of one of several coating means for coating the photopolymer on a flat metal sheet and there is no teaching or suggestion as to the differences in coating methods between flat sheets and cylindrical sleeves. Based thereon, Robinson does not describe or suggest the particular claimed feature of projecting pre-formulated powders onto a support sleeve to produce the plate. There is no teaching or suggestion in Robinson that would render obvious the use of projecting pre-formulated powders on a round cylinder in the specific process claimed by in the present invention.

Based thereon, is believed that the present invention can be distinguished from the alleged AAPA as modified by Teng alone or in combination with Robinson and the rejection of claim 14 as being unpatentable over AAPA in view of Teng and Robinson should be withdrawn.

e. **Rejection of Claims 20, 21 and 26 under 35 U.S.C. § 103(a) over alleged AAPA in view of Teng and Francille.**

Firstly, the comments regarding the allegedly admitted prior art and Teng, as made above and in the Appeal Brief filed on October 2, 2009, are incorporated herein.

With regard to claim 20, Francille does not disclose the use of a second sleeve containing an inserted layer for variation of the thickness of the sleeve. Instead Francille merely reveals the possibility of using two sleeves for use in changing sleeves in order to save time. Thus it can be seen that the purpose of using two sleeves in Francille is very different from the use described and claimed in the present invention and there is no teaching or suggestion of the use of the inserted layer for variation of the thickness of the sleeve. Furthermore, with regards to claim 21, because Francille is only describing the use of two sleeves for use in changing sleeves there is also no teaching or suggestion as to the use of a compressible inserted layer.

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Lastly with regard to claim 26, there is no teaching or suggestion in any of the references, alone or in combination, as to the use of a plurality of layers of light sensitive material.

Based thereon, is believed that the present invention can be distinguished from the alleged AAPA as modified by Teng alone or in combination with Francille and the rejection of claims 20, 21 and 26 as being unpatentable over AAPA in view of Teng and Francille should be withdrawn.

CONCLUSION

The Examiner's rejection of claims 1-17 and 19-29 should be reversed for the reasons set forth in the Appeal Brief submitted on October 2, 2009 and for the reasons set forth herein.

Appellants respectfully submit that the references cited by the Examiner are insufficient to render the pending claims anticipated and/or obvious. As a result, it is believed that the rejections proposed by the Examiner are inappropriate, should be overturned, and that this application should pass to allowance. Such action is earnestly sought.

Respectfully submitted,

Jennifer A. Calcagni, Reg. 50,207
Carmody & Torrance LLP
50 Leavenworth Street
P. O. Box 1110
Waterbury, CT 06721-1110
(203) 575-2648